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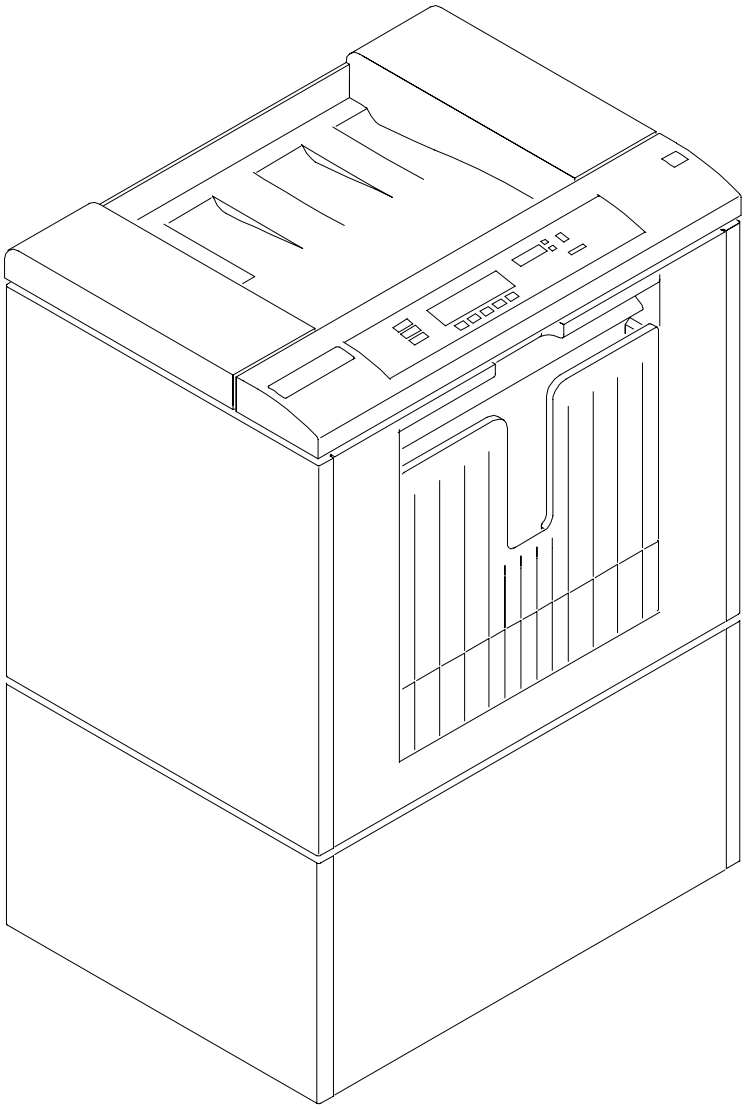
OPERATOR MANUAL

for the

Kodak X-Omat 270 RA PROCESSOR



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WARNING

To avoid hazardous conditions, keep floors and floor coverings around your KODAK X-OMAT Processor and associated drains clean and dry at all times. Any accumulation of fluids from mixing tanks, drain lines, etc, should be cleaned up immediately. In the event of an accumulation of liquid due to backup, overflow, or other malfunctions of the drain associated with your KODAK X-OMAT Processor, call a plumber or other contractor to correct any problem with the drain. Kodak accepts no responsibility or liability whatsoever for the serviceability of any drain connected to or associated with a KODAK X-OMAT Processor. Such drains are the sole responsibility of the customer.

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Product Description

The KODAK X-OMAT 270 RA Processor is a general-purpose radiographic processor, which uses a conventional roller transport system to accommodate both roll and sheet film.

Features of the 270 RA Processor include Microprocessor control, an operator interface, error detection and indicators, and ‘‘smart’’ replenishment. The 270 RA Processor also provides 4 operator-selectable film processing cycles, which run at 4 default transport speeds. The 4 cycles are:

- Kwik (K/RA)
- Rapid
- Standard
- Extended

Each cycle has default parameters for transport speed, developer, and fixer replenishment volumes and for developer, fixer, and dryer temperatures. These default parameters are stored in memory but can be modified by the operator. A battery supplies uninterrupted power to the memory so that the parameters do not have to be reentered each time the Processor is deenergized.

All cycles, except for the K/RA cycle, use standard RP chemicals and film. The K/RA cycle, however, requires RA chemicals and film.

Identifying the Covers and Panels and Other Components of the Processor

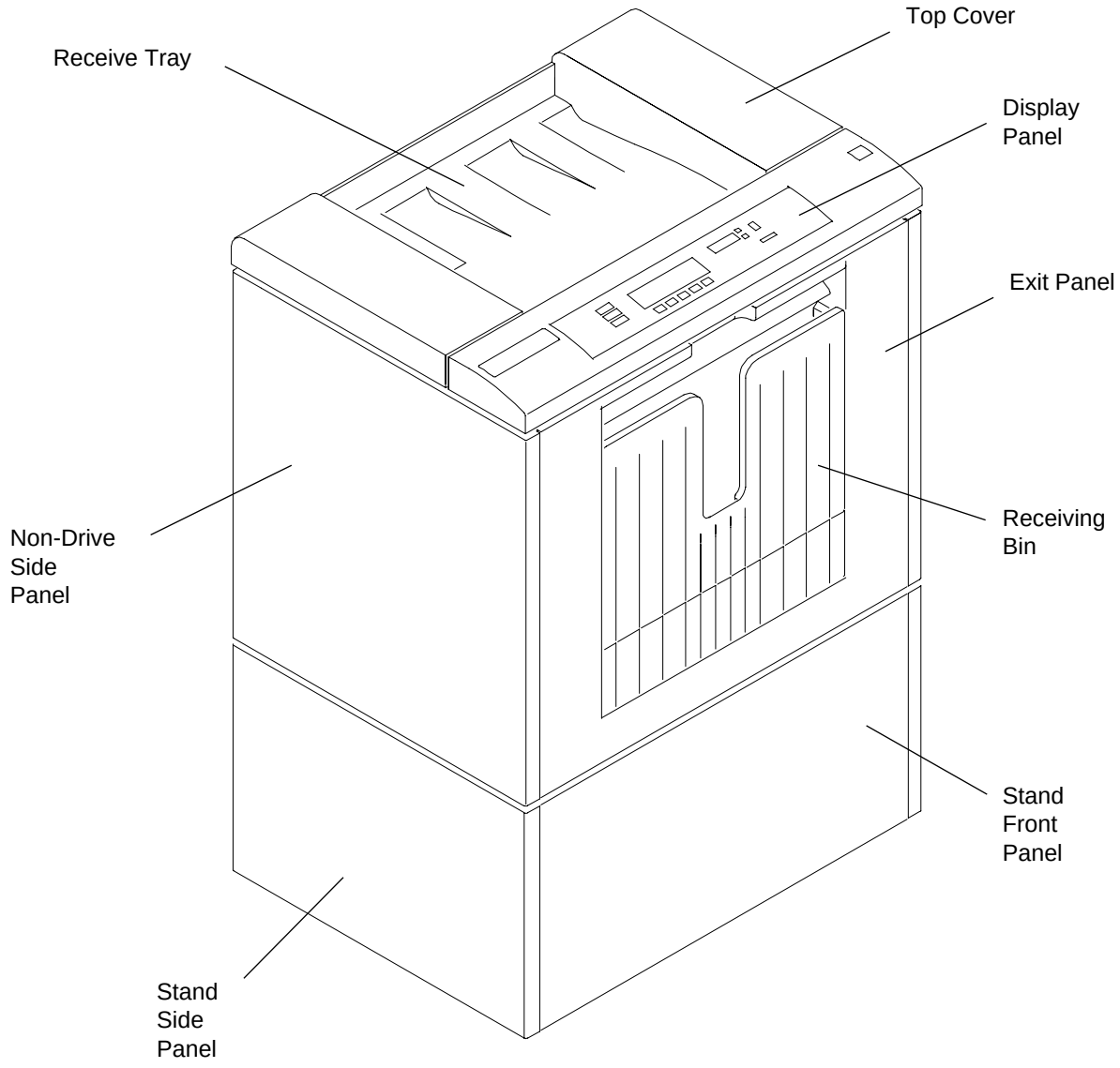


Figure 1 Receive End of the Processor

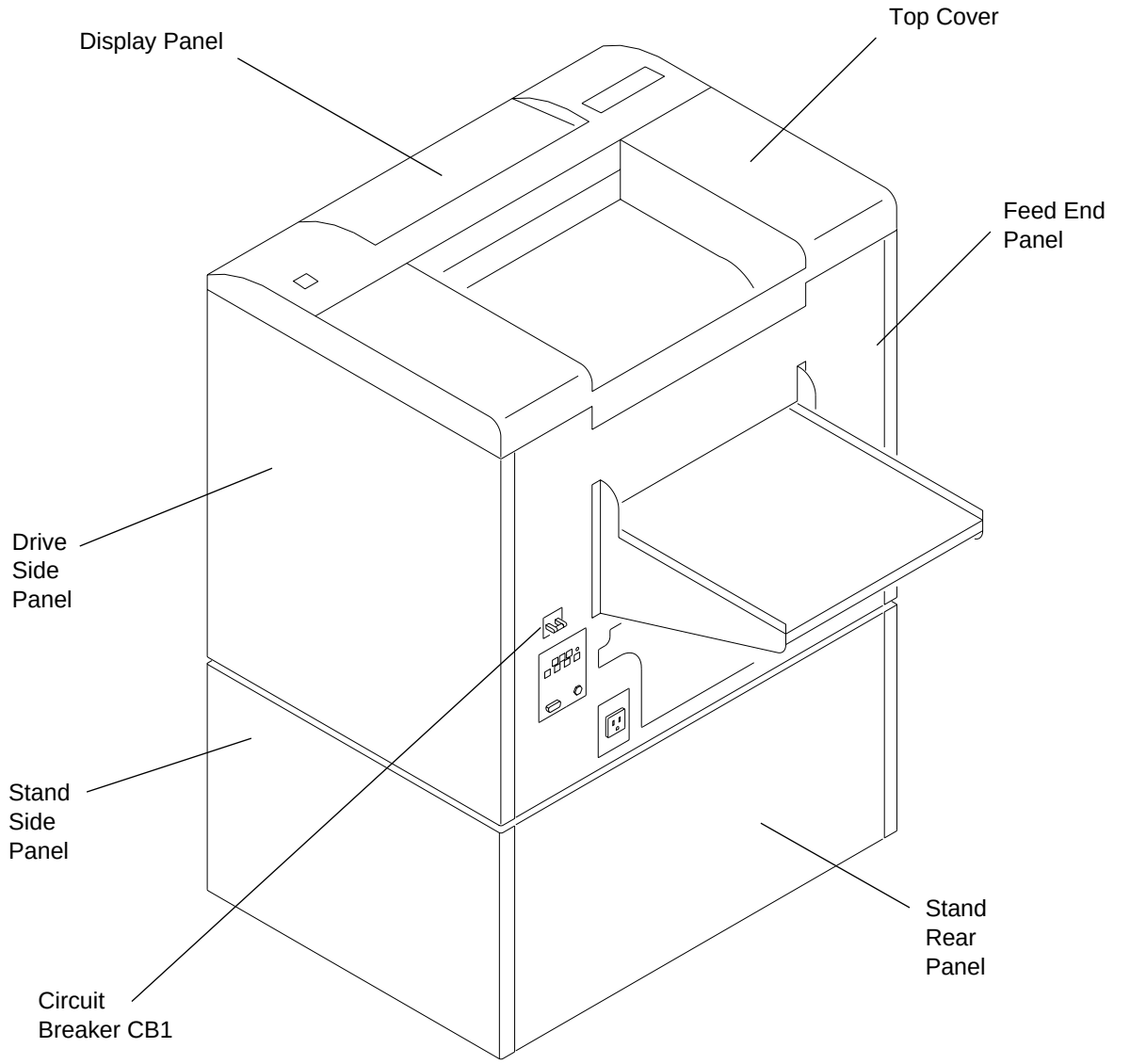


Figure 2 Feed End of the Processor

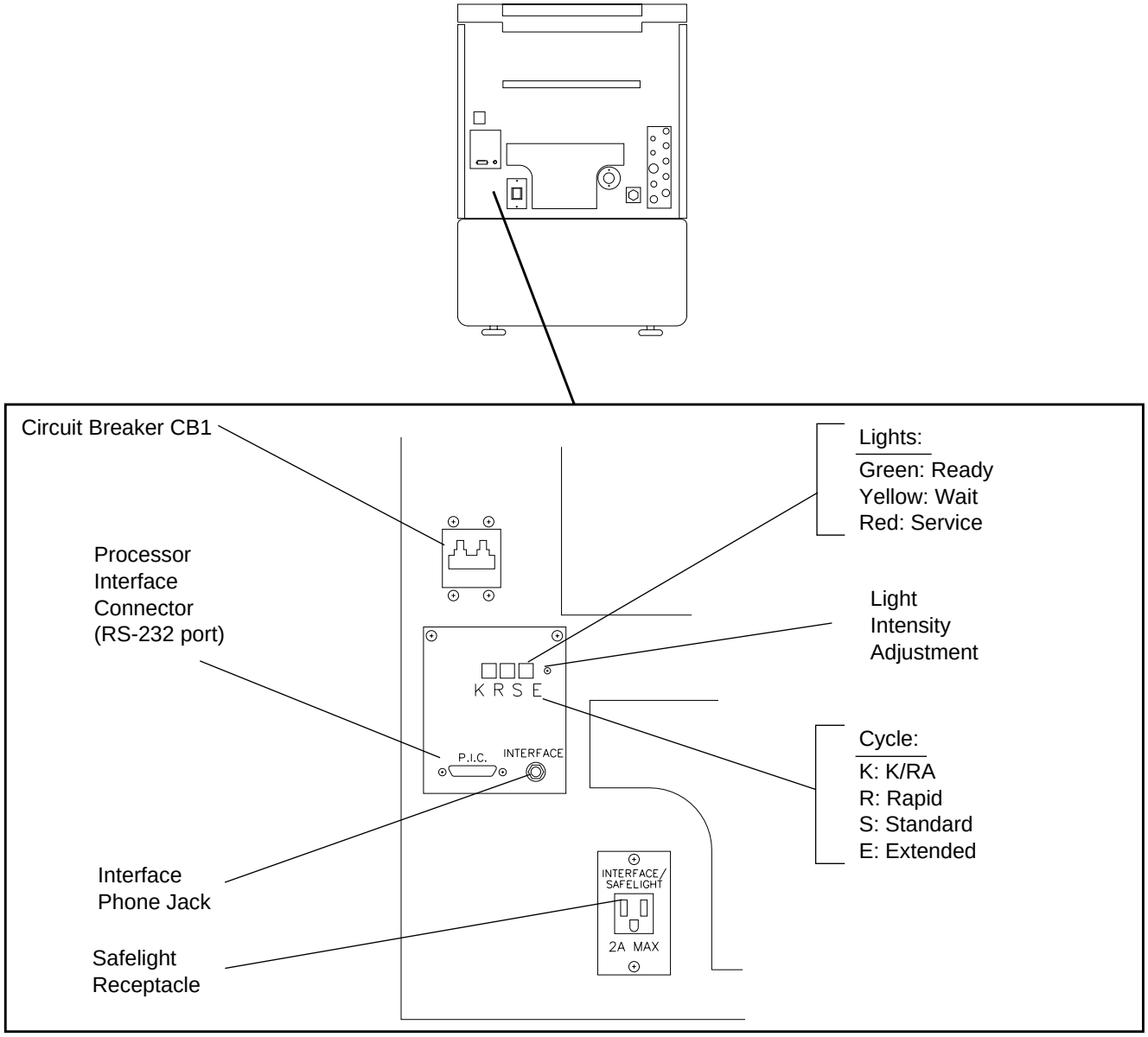


Figure 3 Circuit Breaker and Safelight

Display Panel

The operator selects, changes, and monitors processing variables for the KODAK X-OMAT 270 RA Processor, using the Display Panel. See the figure below.

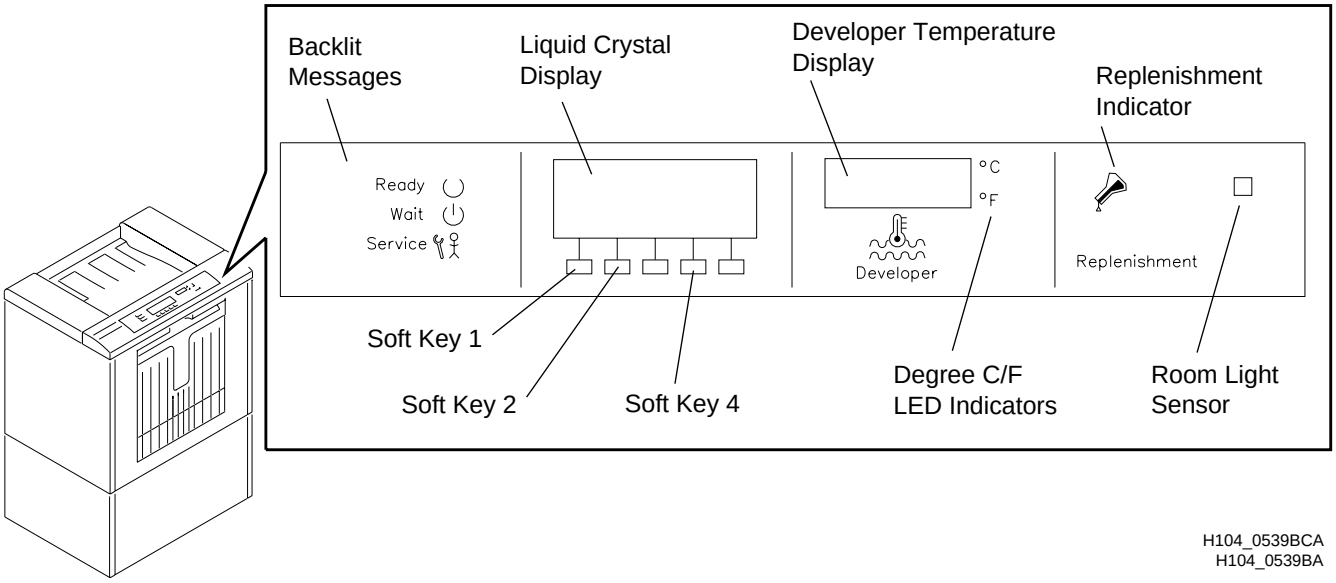


Figure 4 Display Panel

The Display Panel provides the following status information of the Processor:

- Ready/Not Ready
- Message/Error
- Current cycle
- Current function for each of the Soft Keys
- Developer Temperature °C or °F Indicator, which provides the current temperature of the developer in the Processor tank
- Replenishment Indicator, which illuminates when the Replenishment Pumps are operating

The **''Ready''** LED on the Display Panel indicates that the Processor is ready to accept film.

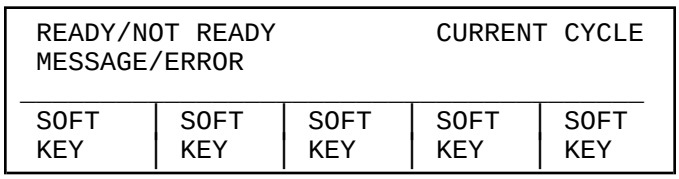
The **''Wait''** LED indicates that the Processor has not yet reached optimum film processing conditions. See page 16 for further description of ''Wait'' events.

The **''Service''** LED indicates that the Processor has an error that the operator cannot repair.

NOTE

- See page 48 for the complete Flowchart for the operation of the display on the Processor.
- The Room Light Sensor disables the Display Panel when the room is dark or if the Sensor is covered by something such as papers or your hand.

The Display Panel has 5 keys called ''Soft Keys'' that the operator uses to select, change, and monitor Processor variables. These keys are located just below the Liquid Crystal Display (LCD):



After a key has been used to make a selection from the menus displayed on the LCD, the functions of the first 4 keys change to describe the next lower level of menu selections. Keys not used are blank. When pressed, the fifth key, ''DONE/RETURN'' completes the entry and displays on the LCD the next higher menu level. See page 48 to view the Menu Flowchart for the RA Processor Display Panel. In addition, procedures contained in this publication show step-by-step the readout of the LCD after each key selection.

Adjusting the Contrast of the Liquid Crystal Display (Display Panel)

[1] To lighten the display, press and hold Soft Key 4 on the Display Panel. See Figure 4 on page 8. At the same time, press Soft Key 2 on the Display Panel to obtain the desired contrast.

[2] To darken the display, press and hold Soft Key 4 on the Display Panel. At the same time, press Soft Key 1 on the Display Panel to obtain the desired contrast.

Film Processing Cycles

A Cycle is one of the 4 ways to process film in the Processor. The Extended, Standard, and Rapid cycles are available through the Display Panel. The Kwik (K/RA) cycle, which provides the fastest film processing time, requires use of the access code. See page 12 for more information on the access code.

The Microprocessor automatically adjusts the transport speed, replenishment volumes, and solution and dryer temperatures to the programmed values for a selected cycle.

Cycle Information for the Processor

Cycle	Process Time in seconds	Drop Time in seconds	Film and Chemicals	Throughput films/hour
Kwik (K/RA)	48	59	RA Film and Chemicals	268
Rapid	64	79	RA or RP Film, RP Chemicals	201
Standard	80	98	RA or RP Film, RP Chemicals	162
Extended	173	213	RP Film and Chemicals	74

Process Time is the time it takes the **leading edge** of a sheet of film to travel from the Detector Rollers to the Exit Rollers of the Dryer Rack.

Drop Time is the time it takes the **leading edge** of a 35 x 43 cm sheet of film (fed 43 cm wide) to enter the Detector Rollers and the **trailing edge** to exit the Dryer Rack.

Film/Chemical is the combination of film and chemicals required for optimum image quality when using the Processor. KODAK *RP* X-OMAT Developer Replenisher and KODAK *RP* X-OMAT Fixer and Replenisher, or equivalents, may be used with the Extended, Standard, and Rapid cycles. **Only KODAK *RA* X-OMAT Films and Chemicals may be used for the K/RA cycle.** Contact your Kodak representative to discuss the best option for your needs.

Throughput is the number of 35 x 43 cm sheets of film (fed 43 cm wide) that can be processed in one hour.

Replenishment Modes

Automatic Replenishment Mode automatically adjusts the replenishment volumes for the developer and fixer according to film usage.

Flooded Replenishment Mode is for low film usage, less than 25 35 x 43 cm (14 x 17 in.) sheets of film per 8-hour day. Chemicals will be replenished automatically every 5 minutes or when the equivalent film area of 35 x 43 cm has been processed.

Tank Fill Mode fills empty processing Tanks automatically until the Level Sensor Probes detect that the Tanks are full.

Disable Replenishment will disable the Replenishment Pumps when you do any cleaning procedures.

Processor Configuration and Setpoints

Setup information consists of the film Processor configuration and process setpoints. Setup information that was preset at the factory is listed in the table below.

Setup information is stored in battery backed-up RAM (Random Access Memory). Therefore, you do not need to program new values every time that you turn on the Processor. **Even if power to the Processor is interrupted or the Processor is turned off, you do not need to program the Processor.**

If you wish, you may change the setup information by using the Soft Keys on the Display Panel; See ''Processor Setup'' on page 22. The new setup information will be retained in memory when power is interrupted or turned off.

Processor Default Configuration and Setpoints

Item	K/RA	RAPID	STANDARD	EXTENDED
*Replenishment Mode	Automatic	Automatic	Automatic	Automatic
*Temperature Lockout Mode	Off	Off	Off	Off
*Display Units	°F, in./min	°F, in./min	°F, in./min	°F, in./min
*Safelight Receptacle Mode	Safelight	Safelight	Safelight	Safelight
*Standby Mode	Interval	Interval	Interval	Interval
Developer Temperature	35.6°C (96°F)	37.2°C (99°F)	34.4°C (94°F)	34.4°C (94°F)
Fixer Temperature (minimum)	32.2°C (90°F)	35°C (95°F)	32.2°C (90°F)	27.7°C (85°F)
(Automatic) Developer Replenishment (35 x 43 cm sheet)	60 mL	60 mL	60 mL	60 mL
(Automatic) Fixer Replenishment (35 x 43 cm sheet)	85 mL	85 mL	85 mL	85 mL
Transport Speed	193 cm/min (76 in./min)	144.8 cm/min (57 in./min)	106.7 cm/min (42 in./min)	53.3 cm/min (21 in./min)
Dryer Temperature	48.9°C (120°F)	48.9°C (120°F)	48.9°C (120°F)	48.9°C (120°F)

* Indicated parameters are not selectable on a cycle basis.

Access Codes

Only service personnel and one primary person should have use of the access codes. The access code **4213** must be entered after the ''GO TO SETUP'' key on the main menu is pressed.

This access code is necessary:

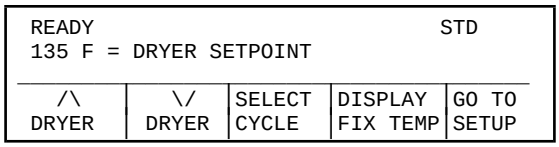
- to change setup information preset at the factory and
- to change to or from the ''K/RA'' cycle

An access code is **not** necessary:

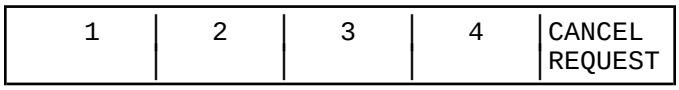
- to select the Processor cycle (except ''K/RA'')
- to change the dryer temperature
- to display the current fixer temperature

A second access code **3244** allows the primary operator access to review Processor status information.

[1] Press the ''GO TO SETUP'' key on the main menu



[2] Enter the 4-digit access code [3] [2] [4] [4] .



[3] Press one of the following:

- ''TOTAL ON TIME'' key for the total time the Processor has been on
- ''SHEET COUNT'' key for how many sheets of film have been been processed
- ''XPORT ON TIME'' key for the total time the transport system has been on

[4] Press the ''DONE/RETURN'' key when you are done reviewing the Processor status information and are ready to return to the previous menu.

Operating Characteristics

- Holding down a Soft Key will cause the key to toggle among all its possible options. For example, holding down the [/\] key, will cause the temperature displayed to increase rapidly, as long as the key is held down.
- When the Processor is first turned on, the wash water and Drive Motor run for a short time and then turn off. The Replenishment Pumps also turn on briefly when the Processor is turned on.
- If either the developer or fixer solution evaporated while the Processor was off, the developer and fixer tanks will be automatically replenished to their overflow levels when the Processor is again turned on.
- When the Film Detector senses film, it turns on the Drive Motor, the water, and the Dryer.
- To prevent the Replenishment Pumps from pumping replenishment solutions when film is not being processed, film area is only accumulated by the Film Sensors **if the film enters the Detector Rollers**.
- The Drive Motor will not operate if the Top Cover of the Processor is open.
- If the Processor is used in an area that is dark or dimly lit, the Processor's room light sensors will detect the lack of bright light and turn off the lights on the display panel to prevent the fogging of the film which it ''thinks'' is being processed. The Soft Keys are also disabled if the Processor is used in an area that is dark or dimly lit.
- On the feed end of the Processor is a panel which indicates the selected film processing cycle and the correct Processor status. A dimmer (Light Intensity Adjustment) is provided to adjust the intensity of these indicator lights.
- Fatal errors cause the alarm on the Processor to sound repeatedly until any film in the Processor exits.
- Non-fatal errors and warnings cause the alarm on the Processor to sound twice when a film is fed into the Film Detector.

Daily Start-up

[1] Check that the Racks and Crossovers are in their correct positions.

[2] Check that the Water Yoke is in position.

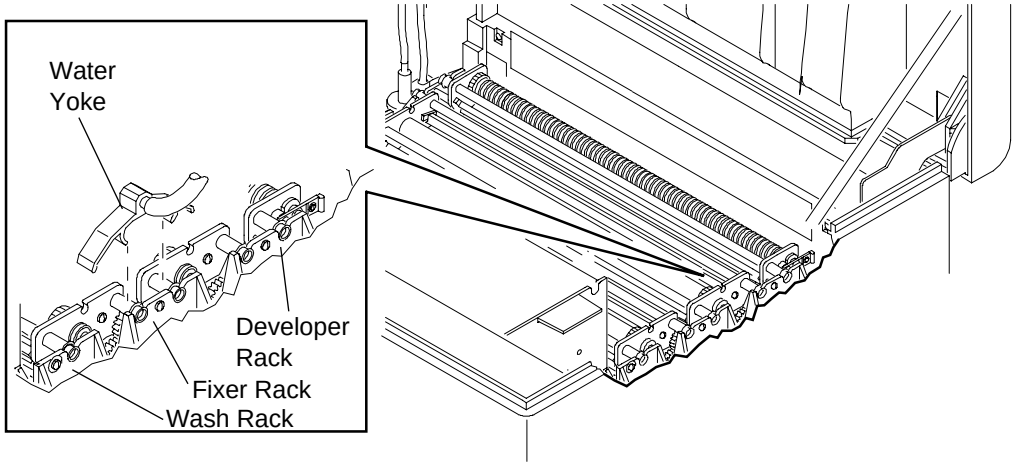


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Figure 5 Rack, Crossover, and Water Yoke Positions

[3] Check that the 2 Water Troughs (not shown) are positioned on the bottom of the Developer/Fixer and Fixer/Wash Crossovers.

[4] Check that the Water Line is connected.

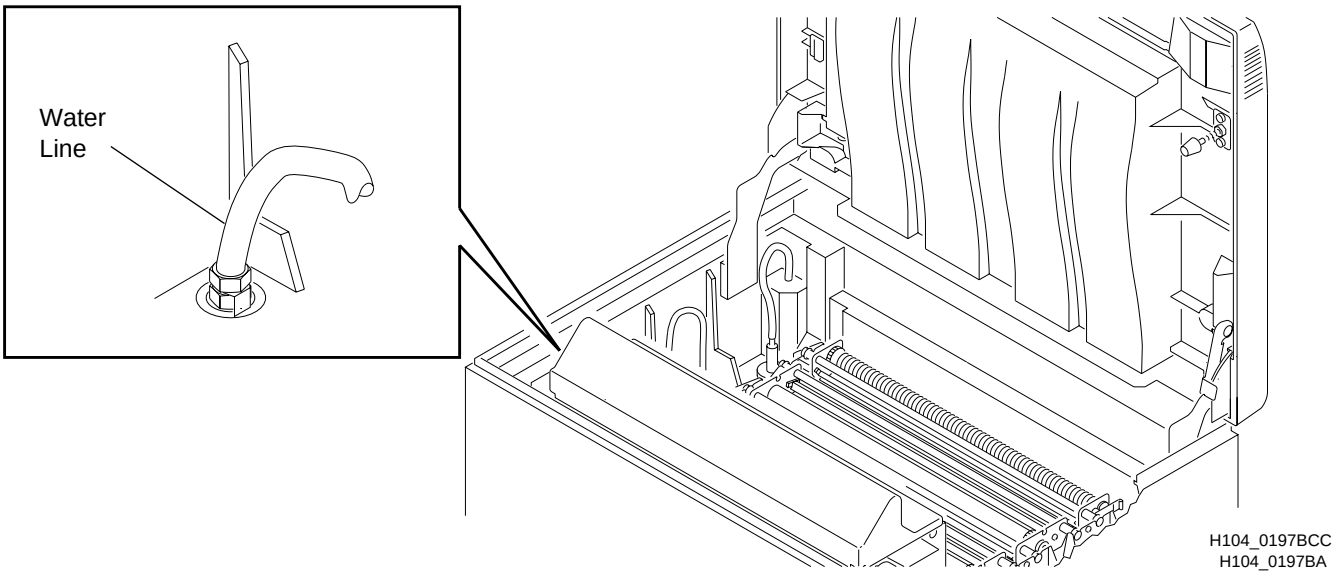

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Figure 6 Water Line Connection

[5] Check that developer and fixer solutions are at the overflow levels of each tank.

[6] Install the Evaporation Covers and the Wet Section Cover if they are not already installed.

[7] Close the Top Cover of the Processor.

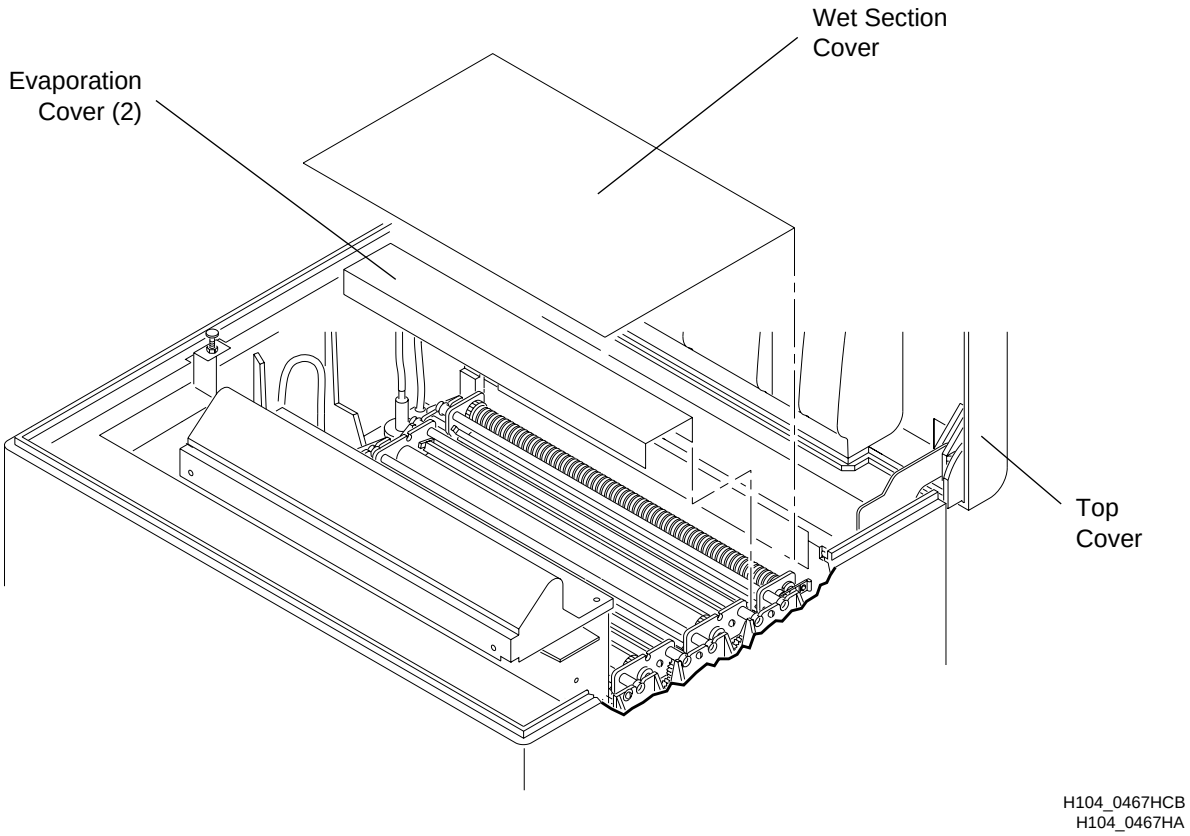


Figure 7 Installing the Wet Section and Evaporation Covers

[8] Turn on the water supply.

NOTE

The incoming water temperature should be between 4° and 29°C (40° and 85°F).

[9] Remove any film from the Feed Shelf.

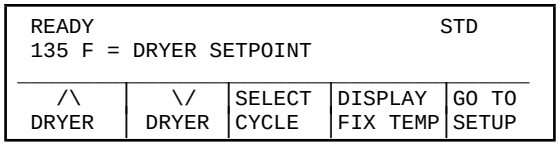
[10] Move the wall power switch to the ‘‘ON’’ position.

[11] Move the main Circuit Breaker CB1 to the ‘‘|’’ position.

IMPORTANT

- You must press the Soft Key for each selection within 20 seconds of completing the previous entry. If you do not press a key within 20 seconds of the previous entry, the LCD will again display the main menu. To activate the display, press any Soft Key twice.
- An alarm ''beep'' will occur twice whenever there is an error condition with the Processor **and** a sheet of film is fed into the Processor.
- The Display Panel will be dark and disabled if the room is dark.

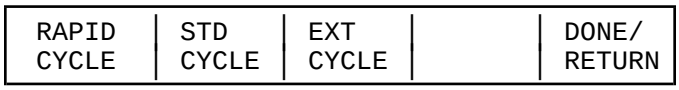
[12] **To change the film processing cycle**, press the ''SELECT CYCLE'' key.



[13] Select the desired film processing cycle, if not K/RA:

- ''RAPID CYCLE'' for the rapid cycle
- ''STD CYCLE'' for the standard cycle
- ''EXT CYCLE'' for the extended cycle

[14] **<u>Immediately,</u> press the ''DONE/RETURN'' key.**



IMPORTANT

- The **''Ready''** LED indicates that the Processor is ready to accept film.
- The **''Wait''** LED indicates that the Processor has not yet reached optimum film processing conditions:
- The **''Service''** LED indicates that the Processor has an error that the operator cannot repair.

Cause of ''Wait'' Condition	Error Code	Film Accepted
Replenishment Pump disabled	E130	Yes
Developer temperature not to specification	E132 or E133	''Temperature Lockout'' OFF: Yes ''Temperature Lockout'' ON: No
Tanks currently being filled	E129	No
Top Cover is not closed	E128	No

[15] When the ‘‘Ready’’ LED comes on, begin processing film.

Located on the feed end of the Processor are 2 rows of status indicator lights. See Figure 8 on page 18.

(a) The first row contains three colored lights indicating the current status of the Processor:

- If the Green ‘‘Ready’’ indicator is illuminated, the Processor is ready to accept film.
- If the Yellow ‘‘Wait’’ indicator is illuminated, the Processor is not yet ready to accept films.
- If the Red ‘‘Service’’ indicator is illuminated, the Processor is in need of service.

(b) The second row contains letters indicating the current film processing cycle:

- If the ‘‘K’’ is illuminated, the Processor is operating in the K/RA cycle.
- If the ‘‘R’’ is illuminated, the Processor is operating in the Rapid cycle.
- If the ‘‘S’’ is illuminated, the Processor is operating in the Standard cycle.
- If the ‘‘E’’ is illuminated, the Processor is operating in the Extended cycle.

You may change the brightness of these indicators by turning the Light Intensity Adjustment located next to the Lights.

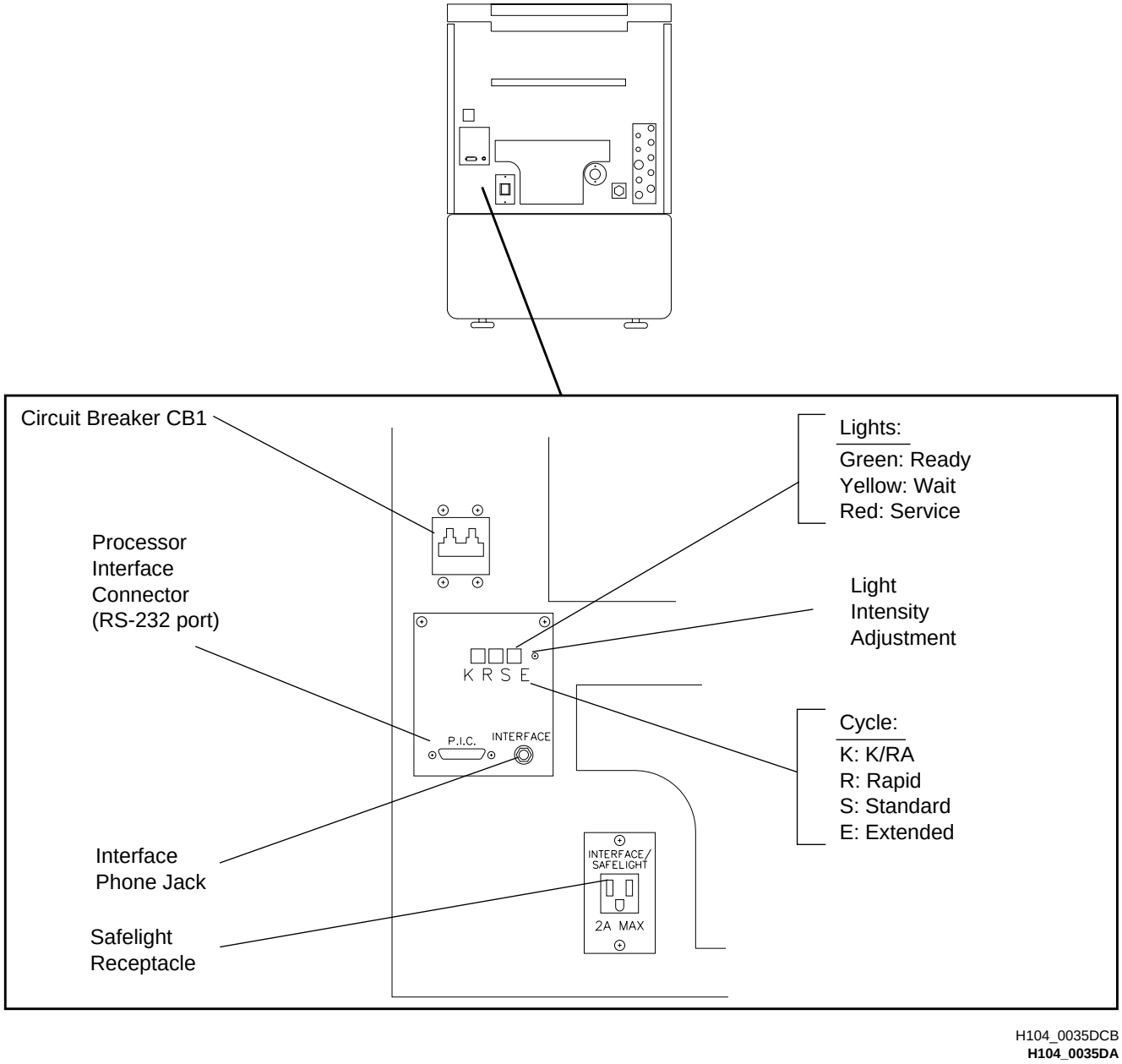


Figure 8 Circuit Breaker, Safelight Receptacle, and Status Indicator Lights

Dryer Temperature Adjustment

[1] Use the main menu to adjust the dryer temperature. You do not need to use the access code. You may select a different dryer temperature for each cycle and store them separately.

IMPORTANT

Always adjust the dryer temperature to the **lowest possible temperature** that still allows good drying.

[2] To change the dryer temperature press the:

- /\ key to **increase** the temperature
- \/ key to **decrease** the temperature

/\ DRYER	\/ DRYER	SELECT CYCLE	DISPLAY FIX TEMP	GO TO SETUP

Film-Feeding Procedure

Sheet Film: See Figure 9 on page 20 for the correct film-insertion procedure. Arrows indicate the direction in which films are transported into the Processor. Choose either the right or the left edge of the Feed Shelf, and always feed films **square** with that edge of the Feed Shelf.

CAUTION

- Feed all single-sided films **emulsion side up** into the Processor, aligning the film edge with the edge of the Feed Shelf.
- Align films consistently with either the right or left edge of the Feed Shelf.
- **Do not** pull back films after you feed them into the Processor.
- **Do not** pull on film as it exits the Processor.
- **Do not** allow too many sheets of films to accumulate in the receiving bin at one time.

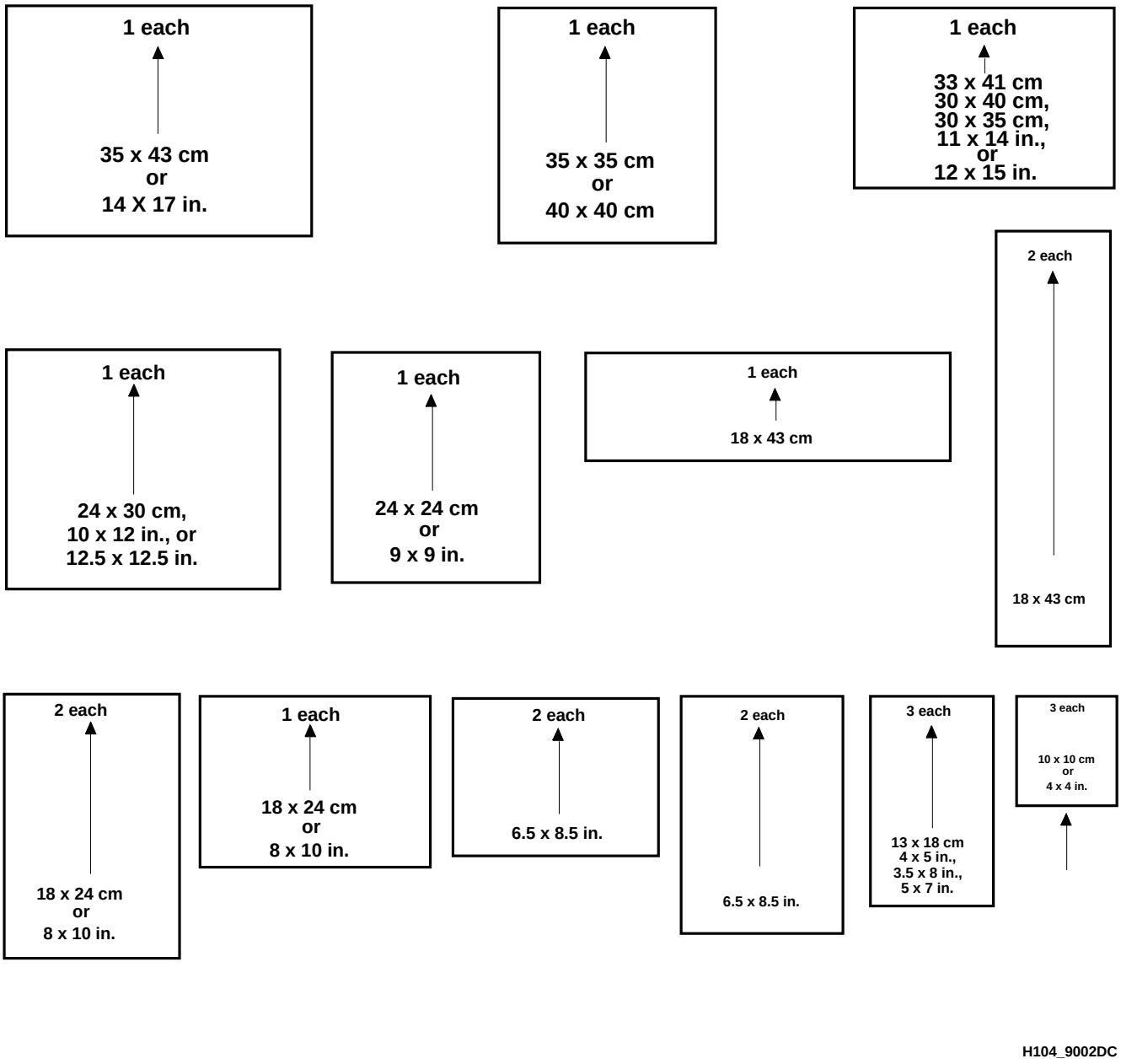


Figure 9 X-Ray Film Sizes

Roll Film: Use a sheet of film as a Leader. Make sure that the sheet film is as wide as, or wider than, the roll film and at least 18 cm (7 in.) long.

Using 2.5 cm (1 in.) wide tape, such as **3M SCOTCH** Brand Polyester Film Tape No. 850, fasten the roll film, emulsion side up, to the Leader, making sure that the adhesive side of the tape is not exposed. Most other types of tape are not acceptable, because their bases are soluble in the processing solutions.

NOTE

Tape the leading edge of the roll film, **emulsion side up,** within 5.1 cm (2 in.) of the vertical (lengthwise) center of the Leader. See Figure 10.

For reliable transport of the roll film, apply slight tension on both the feed and take-up ends of the roll film, such as with a KODAK Roll Film Take-Up, Model 11.

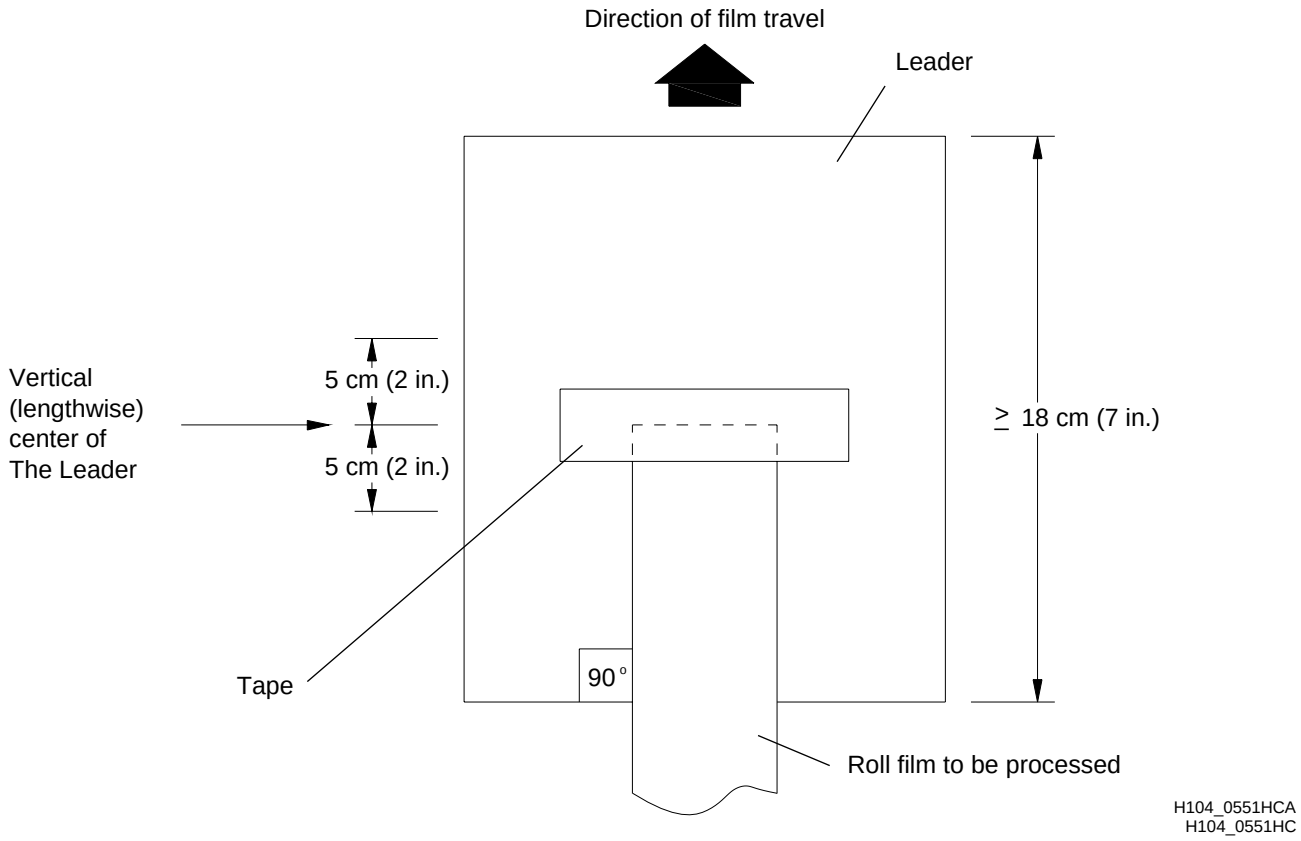


Figure 10 Attaching a Leader to Roll Film

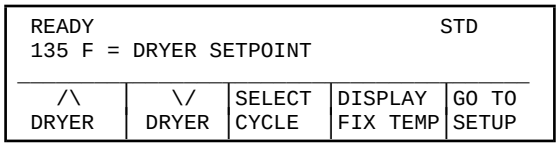
Shutdown

[1] Move the main Circuit Breaker CB1 to the ‘‘O’’ position.

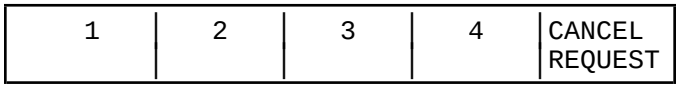
[2] Move the wall power switch to the ‘‘OFF’’ position.

[3] Turn off the water supply.

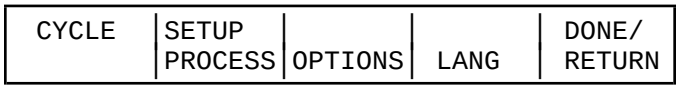
Configuration	
Automatic Replenishment Mode	Select this mode when you want the Processor to adjust automatically the replenishment volumes for developer and fixer according to film usage. See ''Replenishment Volume'' beginning on page 34.
Flooded Replenishment Mode	**Check with your Kodak representative** to see whether the Flooded Replenishment More is right for the film usage of the Processor. Replenishment will be added automatically — • every 5 minutes, achieving a minimum replenishment of 780 mL/hr while the Processor is on **and** • when the equivalent film area of 35 x 43 cm has been processed.
Tank Fill Mode	Select this mode to fill empty Processor Tanks automatically. A warning error E129 occurs as the Tanks are filling. After the Tanks are filled, the error is cleared and the Processor will begin normal operation.
Disable Replenishment	Select this feature to disable the Replenishment Pumps before doing any of the cleaning procedures. When the Pumps are disabled, a warning error E130 occurs. The error is cleared when you select either Automatic or Flooded Replenishment.
Selecting a Replenishment Mode	**To select a replenishment mode:** **[1]** Press the ''GO TO SETUP'' key.



[2] Enter the 4-digit access code [4] [2] [1] [3].



[3] Press the ''OPTIONS'' key.



[4] Press the ''REPLEN MODE'' key.

[5] Select one of the 4 replenishment modes:

- Automatic Replenishment
- Flooded Replenishment
- Tank Fill (You do not need to press ''DONE/RETURN'' when selecting this mode.)
- Disable Replenishment

SELECT AUTO	SELECT FLOODED	TANK FILL	DISABLE REPLEN	DONE/ RETURN

[6] **<u>Immediately,</u> press the ''DONE/RETURN'' key to store the entry.**

SELECT AUTO	SELECT FLOODED	TANK FILL	DISABLE REPLEN	DONE/ RETURN

Temperature Lockout Mode

Pressing ''SELECT ON'' automatically disables the transport system whenever the developer temperature deviates from the specified temperature range. The transport system remains disabled until the temperature of the developer is back within the specified temperature tolerance ± 0.3°C (0.5°F).

Pressing ''SELECT OFF'' allows the Processor to accept film even when the developer temperature deviates from the specified temperature range.

IMPORTANT

When using accessory equipment, the ''Temperature Lockout'' must be ''OFF'' to prevent the accessory equipment from feeding films with the transport off.

To select ''ON'' or ''OFF'' for the Temperature Lockout mode, do the following:

[1] Press the ''GO TO SETUP'' key.

READY STD
135 F = DRYER SETPOINT

/\ DRYER	\/ DRYER	SELECT CYCLE	DISPLAY FIX TEMP	GO TO SETUP

[2] Enter the 4-digit access code [4] [2] [1] [3] .

1	2	3	4	CANCEL REQUEST

[3] Press the ''OPTIONS'' key.

CYCLE	SETUP PROCESS	OPTIONS	LANG	DONE/ RETURN

[4] Press the ‘‘TEMP LOCK’’ key.

REPLEN MODE	TEMP LOCK	DISPLAY UNITS	MORE	DONE/ RETURN

[5] Press the ‘‘SELECT ON’’ or ‘‘SELECT OFF’’ key.

SELECT OFF	SELECT ON			DONE/ RETURN

[6] **<u>Immediately,</u> press the ‘‘DONE/RETURN’’ key to store the entry.**

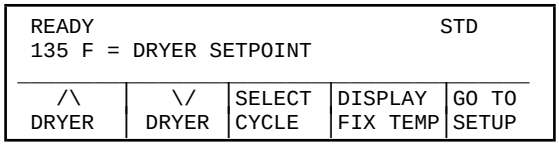
SELECT OFF	SELECT ON			DONE/ RETURN

Display Units for Temperature and Transport Speed

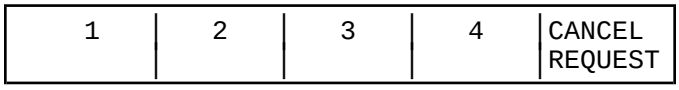
Select ‘‘DISPLAY UNITS’’ to choose either English (°F) or metric (°C) temperature units, and English (in./min) or metric (cm/min) transport speed units.

To change the units displayed for temperature and transport speed, do the following:

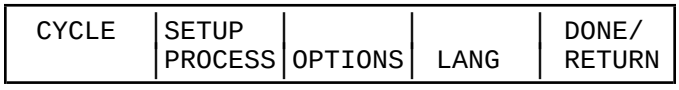
[1] Press the ‘‘GO TO SETUP’’ key.



[2] Enter the 4-digit access code [4] [2] [1] [3] .



[3] Press the ‘‘OPTIONS’’ key.

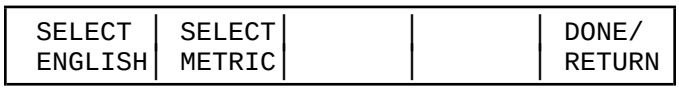


[4] Press the ‘‘DISPLAY UNITS’’ key.

[5] Press either:

- ‘‘SELECT ENGLISH’’ for °F and in./min or
- ‘‘SELECT METRIC’’ for °C and cm/min

[6] **<u>Immediately,</u> press the ‘‘DONE/RETURN’’ key to store the entry.**



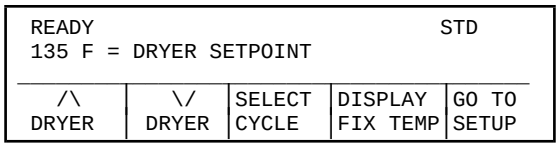
Safelight Receptacle or Accessory Mode

The safelight receptacle, which is located on the feed-end panel (see Figure 8 on page 18), can be set to one of two modes:

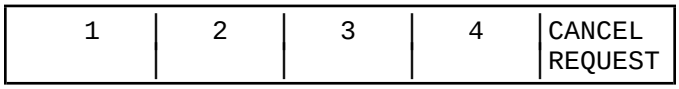
- Accessory mode to provide constant power to accessories, or
- Safelight mode to turn off the safelight outlet when film is fed into the Processor. The period of time that the safelight outlet remains off depends on the transport speed and film length.

To select the Accessory or Safelight mode, do the following:

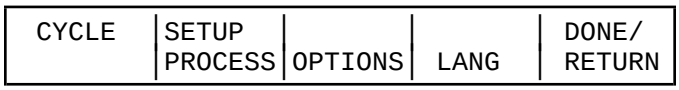
[1] Press the ‘‘GO TO SETUP’’ key.



[2] Enter the 4-digit access code [4] [2] [1] [3] .



[3] Press the ‘‘OPTIONS’’ key.

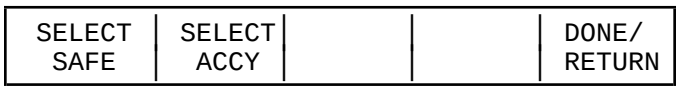


[4] Press the ‘‘MORE’’ key.

[5] Press the ‘‘RECEPT MODE’’ key.

[6] Press either the:

- ‘‘SELECT SAFE’’ key for the Safelight mode or
- ‘‘SELECT ACCY’’ key for the Accessory mode



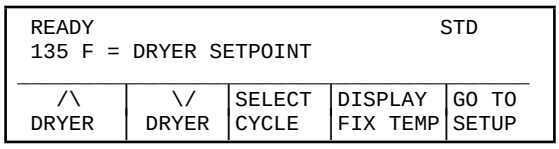
[7] **<u>Immediately,</u> press the ‘‘DONE/RETURN’’ key to store the entry.**

Standby Mode

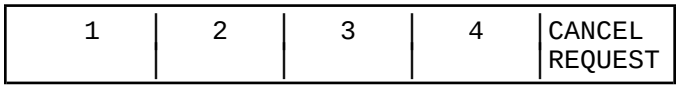
There are 2 modes within the Standby mode — the Interval mode and the Continuous mode. With the Processor in the Interval mode, the transport system will turn on every 8 minutes for 90 seconds to keep the Rollers wet. When the Processor is in the Continuous mode, the transport system will operate continuously at a reduced speed to keep the Rollers wet. In either mode, the Dryer Blower turns on, and wash water is circulated, as required to maintain dryer temperature and developer cooling respectively.

To select the Standby mode, do the following:

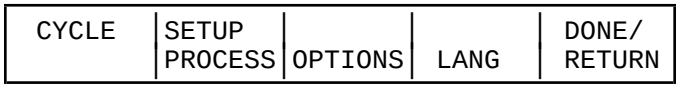
[1] Press the ''GO TO SETUP'' key.



[2] Enter the 4-digit access code [4] [2] [1] [3].



[3] Press the ''OPTIONS'' key.

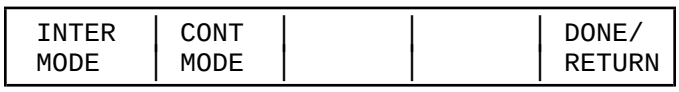


[4] Press the ''MORE'' key.

[5] Press the ''STANDBY MODE'' key.

[6] Press ''INTER MODE'' or ''CONT MODE'' key.

[7] **<u>Immediately,</u> press the ''DONE/RETURN'' key to store the entry.**



Replenishment Calibration

Introduction

Calibrate the replenishment system every 3 months.

Calibrating the replenishment system determines the actual rate of solution flowing through the Replenishment Pumps. Calibration is done by measuring the volume of solution pumped during a set time, then using the Display Panel to enter the measurement into the Microprocessor. The Microprocessor computes the rate of solution flow through the Pump, then adjusts the period of time that the Pump must operate to match the replenishment volume that you set.

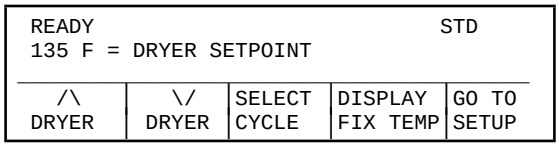
NOTE

The volume actually measured during this procedure is **not** the **volume delivered** for a 35 x 43 cm sheet of film.

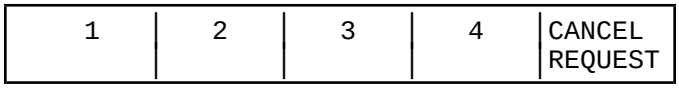
Procedure

To calibrate the replenishment system, do the following:

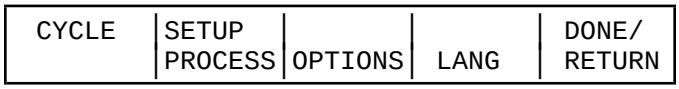
[1] Press the ‘‘GO TO SETUP’’ key.



[2] Enter the 4-digit access code [4] [2] [1] [3].



[3] Press the ‘‘OPTIONS’’ key.



[4] Press the ‘‘MORE’’ key.

[5] Press the ‘‘REPLEN CALIB’’ key.

[6] Press the ‘‘FIX CAL’’ (or ‘‘DEV CAL’’) key.

DEV CAL	FIX CAL			DONE/ RETURN

CAUTION

Wear protective eyewear when executing the following procedure. Replenishment solutions are pumped quickly and may splash.

[7] Open the Top Cover of the Processor.

[8] Remove the Fixer Replenishment (or Developer Replenishment) Hose and place it into the Graduated Cylinder.

[9] Press the Replenishment Calibration Switch on the side wall of the Tank.

[10] Measure and record the volume of replenishment delivered by the system.

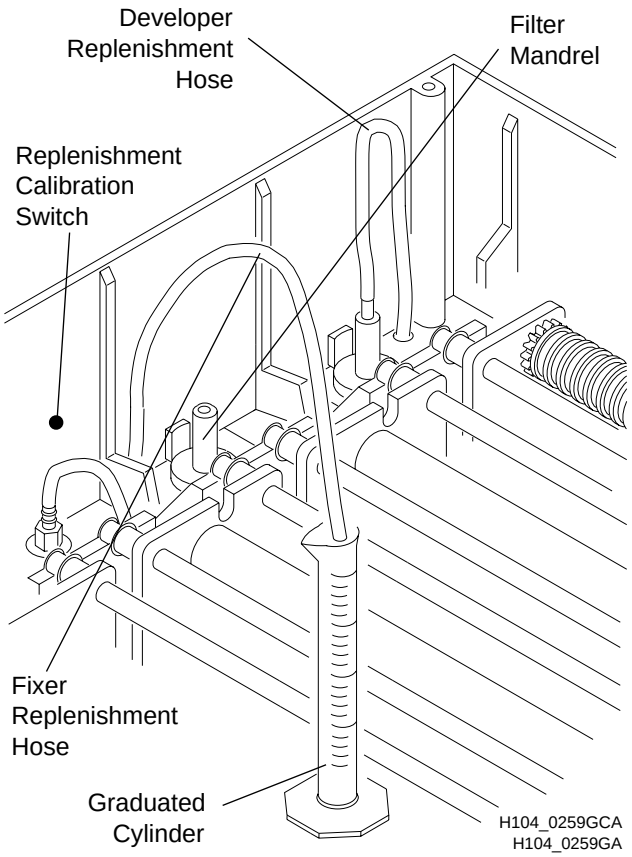


Figure 11 Calibration

[11] Dispose of the solution in the Graduated Cylinder.

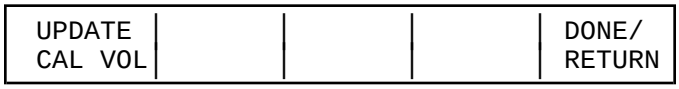
[12] Do Steps 8 through 11 at least 2 more times.

[13] Determine the average volume delivered.

[14] Install the Replenishment Hose into the fixer (or developer) Filter Mandrel.

[15] Close the Top Cover of the Processor.

[16] Press the ''UPDATE CAL VOL'' key.



[17] Press [/\] or [\/] keys until the volume of replenishment displayed equals the average volume you measured in Step 13.

[18] **Immediately, press the ''DONE/RETURN'' key to store the entry.**

[19] Immediately, press the ''DONE/RETURN'' key **again and do** Steps 6 through 18 for the developer.

Checking the Replenishment Volume

CAUTION

Wear protective eyewear when executing the following procedure. Replenishment solutions are pumped quickly and may splash.

[1] Open the Top Cover of the Processor.

[2] Remove the Fixer Replenishment (or Developer Replenishment) Hose and place it into the Graduated Cylinder. See Figure 11 on page 29.

[3] Press and hold the Replenishment Calibration Switch on the side wall of the Tank for approximately 5 seconds. The volume of solution in the Graduated Cylinder should be equal to the amount set on page 34 or 35 for 35 x 43 cm (14 x 17 in.) film in the Automatic Replenishment Mode.

Processor Cycle

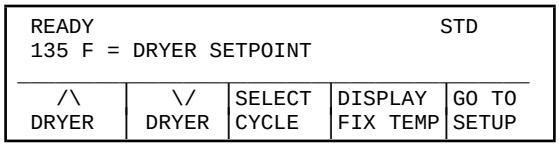
This procedure and the three procedures following it explain how to change process variables whose setpoints were preset at the factory. In most cases, factory setpoints will provide optimum film processing.

IMPORTANT

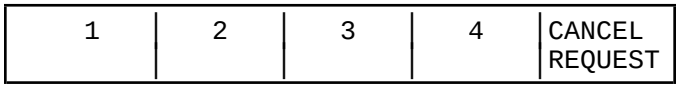
Setpoints are stored for each film processing cycle. Changing a setpoint changes it for only the selected cycle.

To select the film processing cycle, for either RA or RP film and chemicals, do the following:

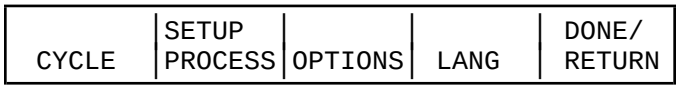
[1] Press the ''GO TO SETUP'' key.



[2] Enter the 4-digit access code [4] [2] [1] [3].



[3] Press the ''CYCLE'' key.



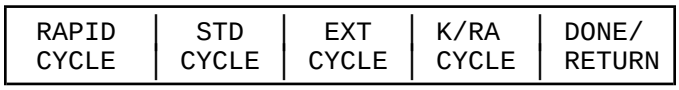
[4] Select the desired cycle:

(a) If using **RP chemicals,** press one of the following keys.

- ''RAPID CYCLE'' key for the rapid cycle
- ''STD CYCLE'' key for the standard cycle
- ''EXT CYCLE'' key for the extended cycle

(b) If using **RA chemicals,** press the ''K/RA CYCLE'' key.

[5] **<u>Immediately,</u> press the ''DONE/RETURN'' key to store the entry.**



Developer and Fixer Temperatures

Developer and fixer temperature setpoints can be modified and stored for future use. Setpoints that were preset at the factory always can be restored by pressing the ''DEFAULT SETTING'' key in Step 7.

To change the temperature setpoints for developer or fixer, do the following:

[1] Press the ''GO TO SETUP'' key.

READY 135 F = DRYER SETPOINT				STD
/\ DRYER	\/ DRYER	SELECT CYCLE	DISPLAY FIX TEMP	GO TO SETUP

[2] Enter the 4-digit access code [4] [2] [1] [3].

1	2	3	4	CANCEL REQUEST

[3] Press the ''SETUP PROCESS'' key.

CYCLE	SETUP PROCESS	OPTIONS	LANG	DONE/ RETURN

[4] Select the current film processing cycle:

- ''RAPID CYCLE'' for the rapid cycle
- ''STD CYCLE'' for the standard cycle
- ''EXT CYCLE'' for the extended cycle
- ''K/RA CYCLE'' for the K/RA cycle

RAPID CYCLE	STD CYCLE	EXT CYCLE	K/RA CYCLE	DONE/ RETURN

[5] Press the ''TEMP'' key.

TEMP	REPLEN VOLUME	SPEED		DONE/ RETURN

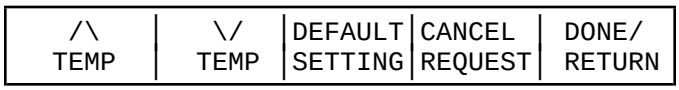
[6] Press either the:

- ''DEV TEMP'' key to change the developer temperature or
- ''FIX TEMP'' key to change the fixer temperature

DEV TEMP	FIX TEMP			DONE/ RETURN

[7] To change the temperature setpoint, press the:

- [/\] key **to increase** the temperature setpoint
- [\/] key **to decrease** the temperature setpoint
- ''DEFAULT SETTING'' key to return to the factory setpoint
- ''CANCEL REQUEST'' key to return to the last value set



[8] **<u>Immediately,</u> press the ''DONE/RETURN'' key to store the entry.**

[9] Do Steps 6 through 8 for the fixer (or the developer) solution.

NOTE

The temperature setpoint for the fixer solution is a minimum only; the temperature may rise above this setpoint.

Replenishment Volume

Changes to the replenishment volume will be stored for the cycle until new changes are made. Replenishment volume is dependent on the replenishment mode: Automatic or Flooded.

In the **Automatic Replenishment** mode, replenishment solutions are added when an area of film equivalent to approximately 1500 cm^2 (238 $in.^2$) has been processed, for example, one 35 x 43 cm (14 x 17 in.) sheet of film. The default values for this size of film are 60 mL of developer and 85 mL of fixer.

As film usage for the Processor lessens, the volumes of developer and fixer necessary for correct replenishment increase.

Films / 24 Hours	(Auto) Replenishment Volume Added Over 4 Hours
less than 55 sheets	1 L (125 mL / ½ hour)
56 - 65 sheets	750 mL (93 mL / ½ hour)
66 - 74 sheets	400 mL (50 mL / ½ hour)

NOTE

The Replenishment Pumps will automatically turn on every half hour during the 4-hour period when extra replenisher is added. This is normal.

In the **Flooded Replenishment** mode, developer and fixer replenishment default volumes are—

- 65 mL every 5 minutes **and**
- 65 mL for each 1500 cm^2 (238 $in.^2$) of film.

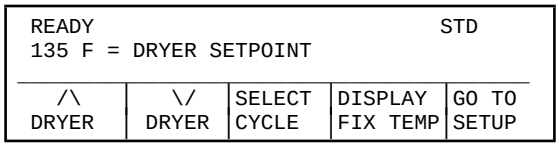
Changing Replenishment Volume

IMPORTANT

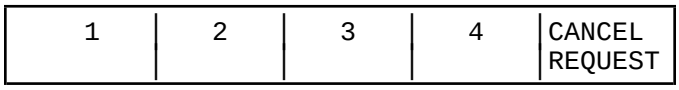
Before changing the replenishment rates, do a replenishment calibration. See page 28.

To change the replenishment volume, do the following:

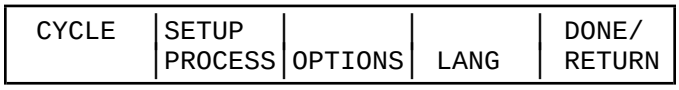
[1] Press the ''GO TO SETUP'' key.



[2] Enter the 4-digit access code [4] [2] [1] [3].



[3] Press the ''SETUP PROCESS'' key.



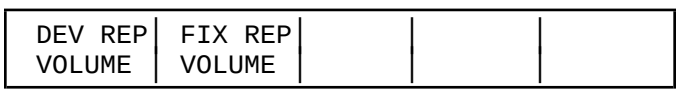
[4] Select the film processing cycle:

- ''RAPID CYCLE'' for the rapid cycle
- ''STD CYCLE'' for the standard cycle
- ''EXT CYCLE'' for the extended cycle
- ''K/RA CYCLE'' for the K/RA cycle

[5] Press the ''REPLEN VOLUME'' key.

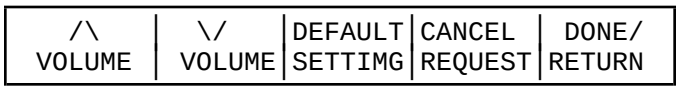
[6] Press the:

- ''DEV REP VOLUME'' key to change the developer replenishment volume or
- ''FIX REP VOLUME'' key to change the fixer replenishment volume

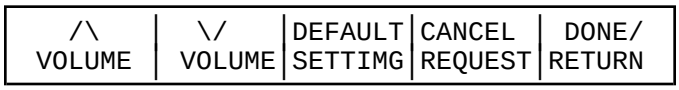


[7] To change the replenishment volume, press:

- [/\] key to increase the replenishment volume
- [\/] key to decrease the replenishment volume
- ''DEFAULT SETTING'' key to return to the factory values
- ''CANCEL REQUEST'' key to return to the last value set



[8] **<u>Immediately,</u> press the ''DONE/RETURN'' key to store the entry.**

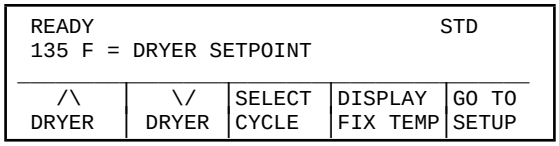


[9] Do Steps 6 through 8 for the fixer (or developer) solution.

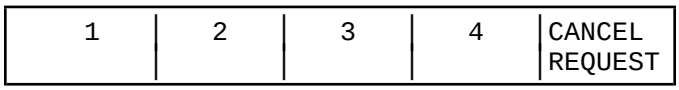
Setting the Transport Speed

The transport speed can be changed for each cycle. The new speed value will be stored for that cycle. **To change the transport speed**, do the following:

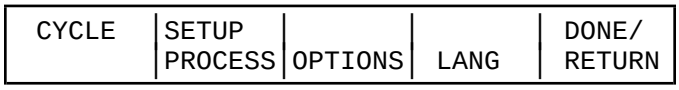
[1] Press the ''GO TO SETUP'' key.



[2] Enter the 4-digit access code [4] [2] [1] [3] .

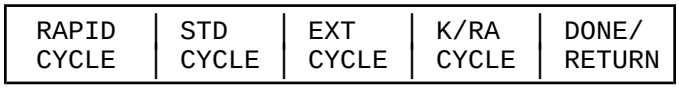


[3] Press the ''SETUP PROCESS'' key.



[4] Select the current film processing cycle:

- ''RAPID CYCLE'' for the rapid cycle
- ''STD CYCLE'' for the standard cycle
- ''EXT CYCLE'' for the extended cycle
- ''K/RA CYCLE'' for the K/RA cycle

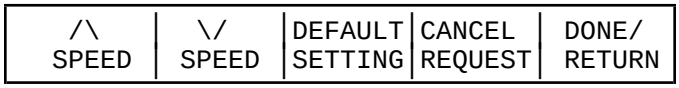


[5] Press the ''SPEED'' key.

[6] To change the transport speed, press:

- [/\] key to increase the transport speed
- [\/] key to decrease the transport speed
- ''DEFAULT SETTING'' key to return to the factory setpoint speed
- ''CANCEL REQUEST'' key to return to the last value set

[7] **<u>Immediately,</u> press the ''DONE/RETURN'' key to store the entry.**



Language Option

Introduction

The Processor displays messages in 12 different languages:

Danish	Italian
Dutch	Japanese
English	Norwegian
Finnish	Portuguese
French	Spanish
German	Swedish

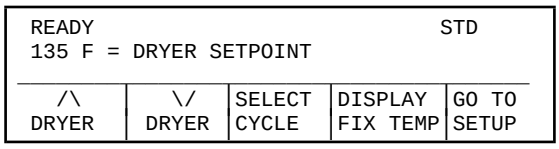
NOTE

Japanese requires a dedicated chip set. Contact your Kodak representative.

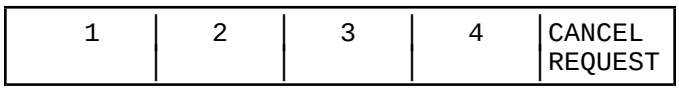
Procedure

To change the language, do the following:

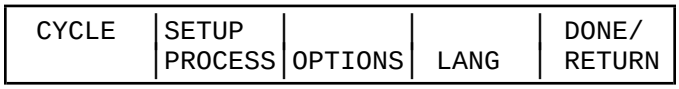
[1] Press the ''GO TO SETUP'' key.



[2] Enter the 4-digit access code [4] [2] [1] [3].



[3] Press the ''LANG'' key.



[4] Select the:

- desired language key, **or**
- ''MORE'' key for other language options

[5] **Immediately, press the ''DONE/RETURN'' key to store the entry.** The language change will take effect after the ''DONE/RETURN'' key is pressed.

Mixing the Developer and Fixer Solutions

[1] Move the main Circuit Breaker CB1 to the ‘‘O’’ position.

[2] Close the Developer and Fixer Drains. See Figure 12 on page 40.

[3] Determine which type of chemicals is needed for the film processing cycle that you selected. See the table on page 10.

IMPORTANT

- When mixing chemicals, follow all instructions and precautions.
- Do not mix more than a 2-week supply of developer and fixer replenisher.

[4] Following all directions provided with the solutions, mix at least 19 litres (5 gallons) of each solution.

Draining the Processor Tanks

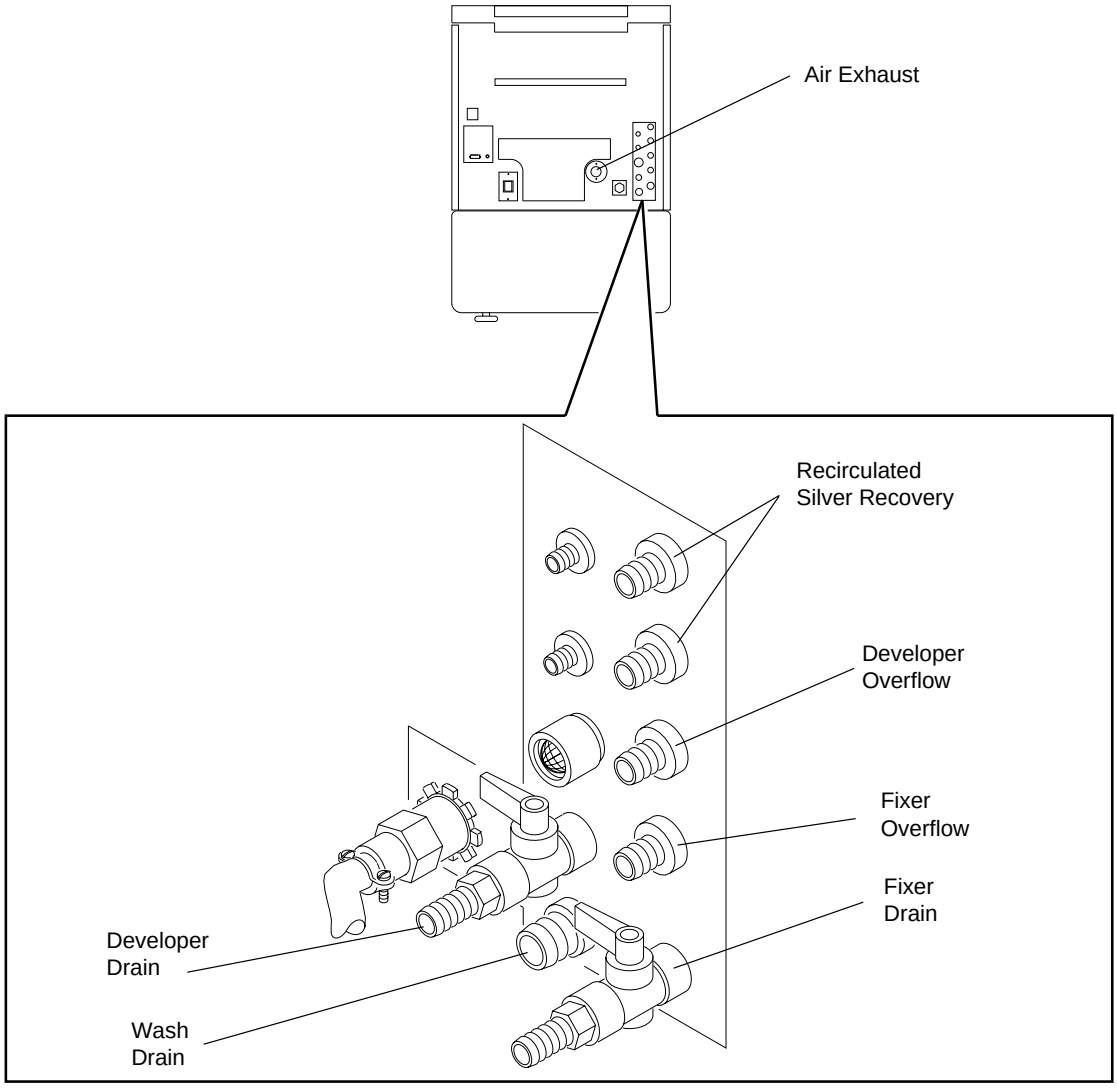
WARNING

- Drains must be made of chemically resistant, non-corrosive material. Use PVC or the equivalent.
- The drain must have a minimum diameter of 7.6 cm (3 in.) and be free of obstruction.
- Drain service must comply with all local codes.
- Do not make a solid connection between the hoses and the drain.
- Locate the drain within 1.5 metres (60 in.) of the Processor.
- The drain line should slope gradually downward to the floor drain.

[1] Open the Fixer and Developer Drains. See Figure 12 on page 40.

NOTE

The Wash Tank does not need to be drained.



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H104_0041DA

Figure 12 Opening or Closing the Fixer and Developer Drain Valves

Filling the Processor Tanks

[1] Check that the Racks are in the correct position.

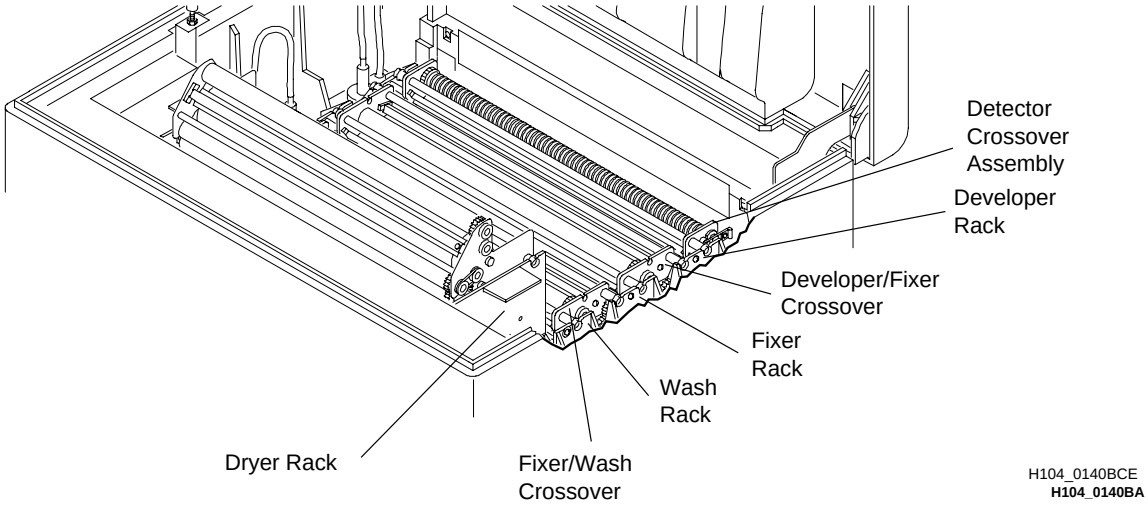


Figure 13 Installing the Racks

IMPORTANT

The Replenishment Pumps automatically start when the Processor is energized.

[2] Move the main Circuit Breaker CB1 to the ‘‘|’’ position.

[3] Close the Developer and Fixer Drains. See Figure 12 on page 40.

[4] Wait for the main menu to appear on the Display Panel.

IMPORTANT

- If you do not press a key within 20 seconds of your previous entry, the LCD will again display the main menu.
- An alarm ‘‘beep’’ will occur twice whenever there is an error condition with the Processor and a sheet of film is fed into the Processor.
- Refer to page 48 to see the ‘‘Menu Flowchart’’.

[5] Press the ‘‘GO TO SETUP’’ key.

READY 135 F = DRYER SETPOINT			STD	
/\ DRYER	\/ DRYER	SELECT CYCLE	DISPLAY FIX TEMP	GO TO SETUP

[6] Enter the 4-digit access code [4] [2] [1] [3].

1	2	3	4	CANCEL REQUEST

[7] Press the ‘‘OPTIONS’’ key.

CYCLE	SETUP PROCESS	OPTIONS	LANG	DONE/ RETURN

[8] Press the ‘‘REPLEN MODE’’ key.

REPLEN MODE	TEMP LOCK	DISPLAY UNITS	MORE	DONE/ RETURN

IMPORTANT

- If the developer and fixer tanks of the Processor are empty and you do not press ‘‘TANK FILL’’, a ‘‘Fill Error’’ will occur in approximately 4 minutes.
- The developer and fixer Tanks will not fill if the Top Cover is open.
- The developer and fixer Tanks require approximately 10 minutes to fill with solution.
- An E129 warning code will appear on the Display Panel while the tanks are filling.
- Once the Tanks are full, the Replenishment Pumps automatically turn off, and normal Processor operation resumes.

[9] Press the ‘‘TANK FILL’’ key.

SELECT AUTO	SELECT FLOODED	TANK FILL	DISABLE REPLEN	DONE/ RETURN

[10] **<u>Immediately,</u> press the ‘‘DONE/RETURN’’ key to store the entry.**

SELECT AUTO	SELECT FLOODED	TANK FILL	DISABLE REPLEN	DONE/ RETURN

[11] After the Replenishment Pumps stop operating, check that:

(a) The level of both the developer and fixer solutions in the Tanks is at the tanks’ overflow limits.

(b) There is some movement on the surface of the developer and fixer solutions to indicate that the Recirculation Pump is operating.

[12] **If using RP chemicals, add 190 mL (6.5 fl oz) of starter solution to the drive side of the Processor’s developer tank.**

IMPORTANT

Reliable operation of the Processor requires that all parts are cleaned, adjusted, and lubricated correctly. More frequent maintenance may be necessary because of site characteristics or actual usage. The following guidelines are for Processors installed according to the specifications in this publication. For monthly and quarterly maintenance, contact your trained service personnel.

Weekly

WARNING

Wear rubber gloves, safety glasses, and protective clothing when doing any daily maintenance procedure. Report any change in the operating condition of the Processor to your service personnel.

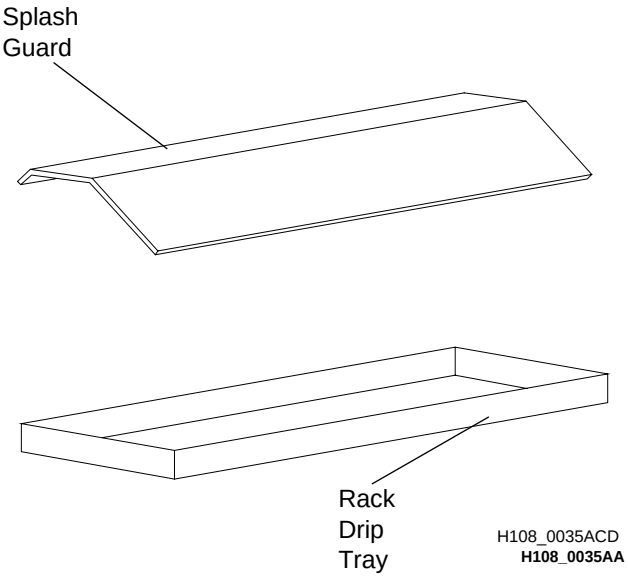
[1] Move the main Circuit Breaker CB1 on the Processor to the ‘‘O’’ position and the wall power switch to the ‘‘OFF’’ position.

[2] Turn off the water supply.

[3] Lift the Top Cover, and disconnect all water tubing from the Racks.

CAUTION

- Handle these assemblies carefully to prevent changing the alignment. **Do not** wash the Racks and Crossovers with water hotter than 44°C (110°F). **Do not** clean the Racks, Crossovers, or Squeegee Rollers using abrasive materials or alcohol.
- To prevent fixer/developer contamination when you remove the Fixer Rack, place the Splash Guard between the developer and fixer Tanks. Use the Rack Drip Tray when you remove or install any of the Racks.



[4] Remove the Wet Section Cover, the Evaporation Covers, all Crossovers, and the Wash Rack.

[5] Rinse the 3 Crossovers and the Wash Rack with warm water, no hotter than 44°C (110°F). Wipe the Rollers and the Guide Shoes with a damp, soft, synthetic sponge.

[6] Allow the Detector Crossover to air dry before you install it in the Processor.

[7] Check that all Rollers on all Crossovers and on the Wash Rack rotate freely. Check the squareness of the Crossovers and the Wash Rack.

[8] Check that the Crossover Troughs are not broken or do not have cracks.

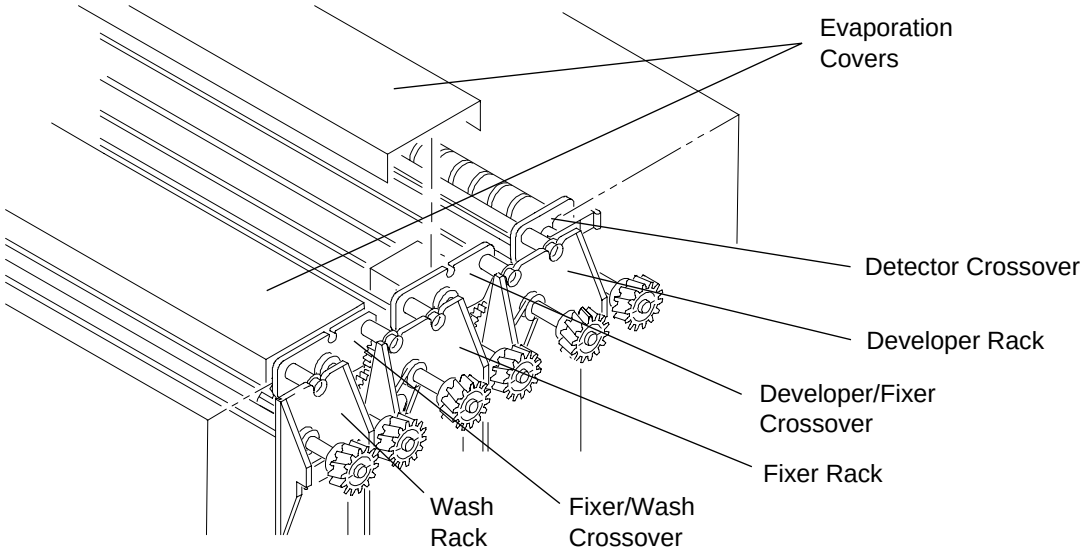
[9] Install the Wash Rack, the Crossovers, the Evaporation Covers, and the Wet Section Cover. Check that each assembly seats firmly.

[10] Wipe any chemical deposits from the processing section of the Processor.

[11] Turn the Processor on and check for correct operation.

[12] Process a test film and check the transport assemblies.

[13] Leave the Top Cover open overnight to allow the parts to dry completely.



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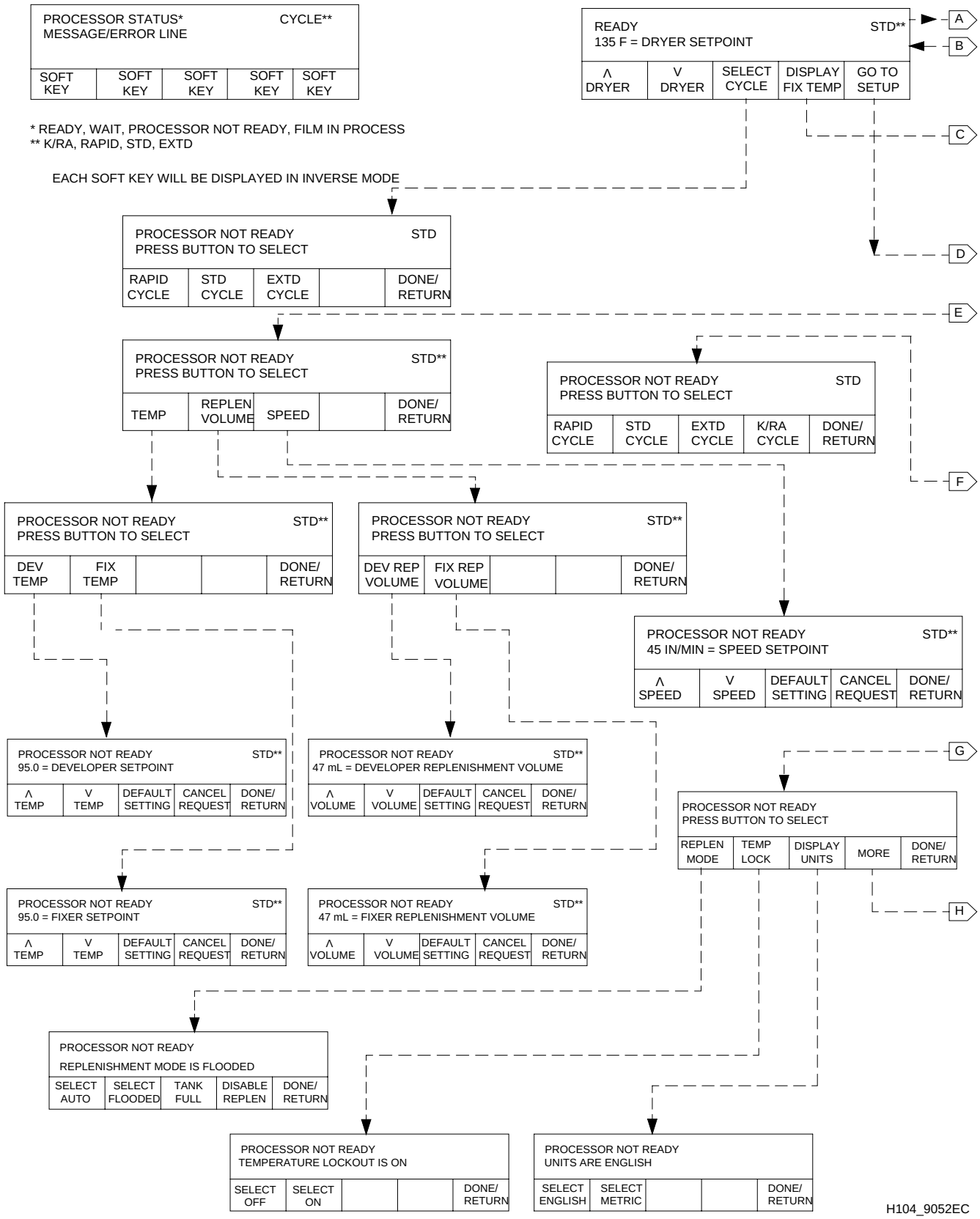
H104_0072BA

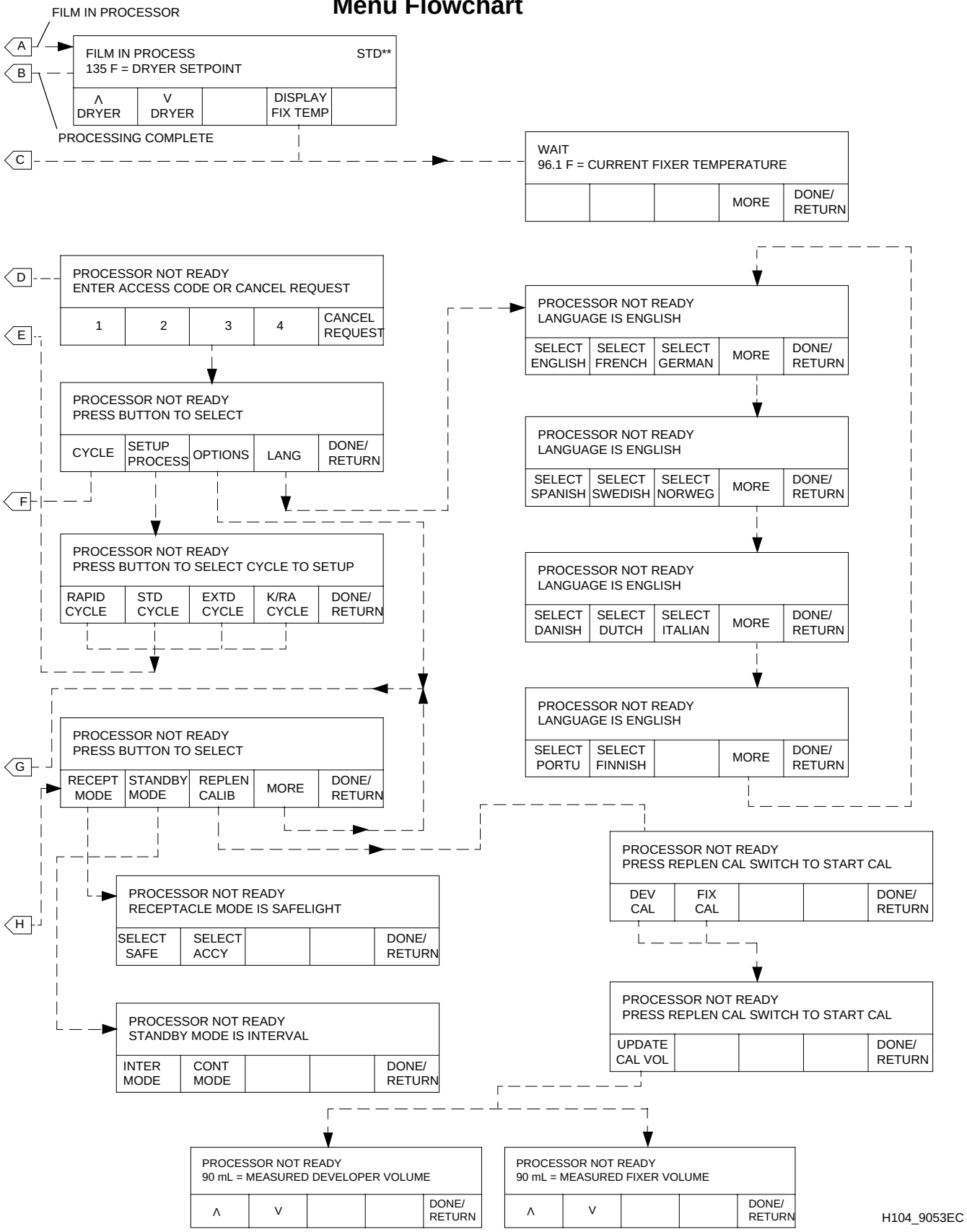
1. Transport Failure	2. Surface Artifacts	3. Abnormal Film Densities	4. Wet Films	5. Low Solution Levels	6. Overlapping of Films	
1	2	3	4	5	6	
•					•	Film Feeding Error ***Feed only single thicknesses of film. Feed next film only after film feed signal. If there is no film feed signal, refer the difficulty to qualified personnel.***
•	•	•	•			Feed only compatible films.
•					•	Check that all racks and crossovers are seated correctly.
•	•					Check that the surfaces of all the rollers are clean and smooth, especially in the developer turnaround.
•			•			Check that the dryer air tubes are in the correct position.
	•		•			Remove any dirt from the dryer rollers and air tubes, especially the slots. Use a bottle brush and rinse with water.
	•	•	•	•		Check the settings for correct replenishment. Check the replenishment system: tubing kinks, pump operation, detector switches, and film detector.
	•					Adjust the dryer temperature control setting to the **lowest** possible temperature consistent with good drying.
	•					Clean the feed shelf and detector rollers.
•	•				•	Clean any bacterial growth in the wash tank with a mild solution of chlorine bleach. Use 60 mL (2 fl oz) of bleach per 3.8 L (1 gallon) of water. Wipe the tanks with a soft sponge.
•				•		Check that drain valves are completely closed. Check that the tanks are full.
•	•	•	•		•	Change any chemicals that were not mixed correctly, are exhausted, or are contaminated. Change the developer filter. Check that replenishment rates are correctly set. Fill the replenishment tanks if necessary. ***Mix the developer replenisher in quantities not to exceed a 2-week supply.*** ***Always use a splash guard and rack drip tray when lifting the fixer rack to prevent contaminating the developer.*** ***Mix chemicals as directed.***
•	•				•	Check that *all* rollers are in place, positioned and rotating correctly.
•	•				•	Check that *all* roller gears, sprockets, and idlers are engaged.
•	•				•	Replace any rollers with broken or worn gudgeons.

1. Transport Failure	2. Surface Artifacts	3. Abnormal Film Densities	4. Wet Films	5. Low Solution Levels	6. Overlapping of Films	
1	2	3	4	5	6	
•	•				•	Replace any bearings that do not allow the turnaround rollers to rotate correctly.
•	•					If incoming wash water is dirty, clean the rack and tank thoroughly. Change the incoming water filter. Be sure to use the correct water filter.
			•			Check that the dryer air exhaust is free from any obstruction and is installed correctly according to specifications in the Installation Instructions.
	•	•				Check incoming water temperature. Temperature must be between 4°C (40°F) and 29°C (85°F).
		•				Check that the correct bulb and safelight filter are in the safelight and at the correct distance from the feed shelf and work surface.
•		•				Check that the cover and panels are secure on the Processor. Check that there are no leaks in the lighttight gasket.
•						If 10 x 10 cm films fail to transport reliably, feed the sheets of films diagonally.
					•	Check the time delay. For all transport speeds, the alarm should sound once the trailing edge of the film has advanced 76 mm (3 in.) into the Processor.
			•			Ambient conditions are out of specification.
•						If the solution temperature is low, the Processor will not accept film. Check that the temperature lockout is ‘‘SELECT ON’’.
				•		Check that level probes are clean and free from build-up. Check that all external replenishment lines are without kinks or air bubbles.

RA Processor Display Panel Menu Flowchart



RA Processor Display Panel Menu Flowchart



Kodak warrants this KODAK X-OMAT 270 RA Processor to function correctly for one year from the date of initial installation, when installed within one year from date of shipment.

Warranty Repair Coverage

If this equipment does not function correctly during the warranty period, the dealer (for KODAK X-OMAT 270 RA Processors) who sold the equipment will provide or arrange for repair of the equipment during the dealer's normal working hours. Such repair service will include any adjustments and/or replacement of parts required to maintain your equipment in good working order.

How To Obtain Service

Should the equipment require service, refer to the sales contract for details on whom to call for service, or contact the dealer (for KODAK X-OMAT 270 RA Processors) who sold the equipment.

Limitations

Warranty service is limited to the contiguous United States, the island of Oahu in Hawaii, and certain areas of Alaska.

This warranty does not cover—

- circumstances beyond the control of Kodak,
- misuse,
- abuse,
- attachments,
- accessories,
- alterations not marketed by Kodak (including service or parts to correct problems resulting from the use of such attachments, accessories, or alterations),
- failure to follow the operating instructions recommended by Kodak,
- supply items.

Kodak makes no other warranties, express or implied, for this equipment.

Repair without charge is the only obligation of both Kodak and the dealer under this warranty. Kodak will not be responsible for any consequential or incidental damages resulting from the sale, use, or improper functioning of this equipment, even if loss or damage is caused by the negligence or other fault of Kodak.

Such damages for which Kodak will not be responsible, include, but are not limited to, loss of revenue or profit, downtime costs, loss of use of the equipment, cost of any substitute equipment, facilities or services or claims of your customers for such damages.

This limitation of liability will not apply to claims for injury to persons or damage to property caused by the sole negligence or fault of Kodak or by persons under its direction or control.

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Publication Change Table						
Revision Date	**ECO No.**	**PCN No.**	**PCN Pub. No.**	**Affected Pages**	**Filename**	**Description**
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